TECHNICAL APPENDIX: CHAPTER III

SUMMARY AND DESCRIPTION OF THE NATIONAL OUTDOOR RECREATION SUPPLY INFORMATION SYSTEM

Introduction

The National Outdoor Recreation Supply Information System (NORSIS) 1997 is a county-level database of outdoor recreation resources in the United States compiled for the 1998 Renewable Resources Planning Act (RPA) Assessment of Outdoor Recreation and Wilderness. It consists of 3,116 observations and 476 variables. The 3,116 observations include independent cities and a single observation for the state of Alaska in addition to county units in the other 49 states. The breakdown is as follows:

Counties	3071
Indep. Cities	44
State of Alaska	1
Total	3116

Independent cities include Baltimore, St. Louis, Carson City, NV and 41 cities in Virginia. Kalawao County, Hawaii was not included in the database because it is a very small island for which none of the source datasets included data. Each county (and independent city) is identified in NORSIS by a unique 5-digit FIPS code with the variable name FIPS. FIPS codes were developed by the U.S. Bureau of Standards to serve as standard identification codes for use by the federal government and others. A list of FIPS codes is not included here, but is available in nearly any Census Bureau product. The NORSIS

database does, however, include the variable NAME which is a character variable specifying the city and state, e.g., Jefferson, CO. Another variable, SQMI, gives the square mileage of the county.

The 476 variables that comprise NORSIS are described in this Appendix. Specific variable names are not listed. Instead, the variables are described under the heading "Information" for each source dataset. Each variable was derived from one of the source datasets and aggregated to a summary measure at the county-level. Typically, these measures are either the sum total of land or water acreage in the county or the sum total of outdoor recreation facility counts, e.g., developed campsites. A number of other variables that, technically, are not recreation resources are also included in the database. These include some socioeconomic descriptors from the U.S. Census, acres in Bailey's ecoregions and divisions, and IMPLAN economic sector information related to the tourism and forest products industries. The detailed description of each variable includes the following information:

a. name and description of the source dataset including:

    * vintage (i.e., year)

    * agency or organization and contact person data were acquired from

b. description of the dataset variables.

NORSIS variables are organized by resource ownership and presented in the following order: Federal, State, Local, and Private resources. Within each ownership, data are presented by type of resource: land, water, snow/ice. Not every ownership category has data for the three types of resources.

Source Datasets and Variable Descriptions

Federal Resources

1. National Wilderness Preservation System (NWPS)

Source Dataset--1993 Resources Planning Act (RPA) Update database, data updated through June 1992. Acquired from: USDA Forest Service. Southern Research Station. SRS-4901. Data compiled by former FS employee Mark Young. Information: NWPS acreage managed by respective federal agencies per county; and Total NWPS acreage per county. (Note: In addition to this database, we also have a database of NWPS units, which lists all Wilderness Areas by agency, state and date designated, with acreage. This database is not at the county level, however, and thus is not part of NORSIS. It was acquired from BLM Special Areas and Land Tenure Group, Rob Hellie, (202) 452-7703. Data are current as of July 3, 1995.

2. USDA Forest Service

Source Dataset: National Forest System Land Area by county, 1995. Acquired from: John Hof, USDA-FS, Rocky Mtn. Forest & Range Expt. Station. Information: Sum total of National Forest and National Grassland acreage per county.

Source Dataset: NORSIS 1987. Acquired from: SRS-4901. Data compiled by Don English for 1989 RPA Assessment. Same data were not available from FS Washington Office Recreation Staff for the 1998 RPA Assessment, so we decided to include data available from 1987 NORSIS. Information: Sum total of number of recreational facilities, miles of road, and campground acres per county.

3. National Park Service

Source Dataset: National Park Service, Master Deed Listing, State and County Report by State. As of 10/31/95. Acquired from: NPS Land Resources Division. Mike Walsh. (202) 343-4861. Information: sum total of NPS acres per county for all units of the National Park Service; acres of

federally-owned land; and acres of all other public and private land within NPS boundaries.

Source Dataset: National Park Service Map and Guide, 1995. Acquired from: NPS National Center for Recreation and Conservation. Merle Van Horne. (202) 565-1192. Information: the sum total of NPS units located in the county that possess a variety of recreational facilities.

Additional data were obtained from Ken Hornback and Tom Wade, both of NPS Socio-Economic Studies Unit, Denver (303) 969-2060. Wade provided NPS Public Use Statistics for years 1979-1995. Hornback provided a personal spreadsheet which included additional information on all units such as presence and amount of user fees, year of designation, and Unit Theme. Neither Wade's nor Hornback's data were used in NORSIS, however.

4. U.S. Army Corps of Engineers

Source Dataset: U.S. Army COE Natural Resource Management System (NRMS) Database, 1994. Acquired from: COE Waterways Experiment Station. Environmental Laboratory. Scott Jackson. (601) 634-2105. (Note--A limitation of COE data on both Projects and Recreation Sites is that only the location of the Project Headquarters Office is given, not the county locations for the entire reservoir and all recreation sites. We corrected as many as possible from map inspections, but locations are still not completely accurate to the county.) Information: Shoreline miles owned by COE at summer pool level; Total acres of land and water encompassed by boundaries of COE Project; Pool surface acreage at COE Project at summer pool level; Acreage of all fee lands designated in Master Plan for recreation development. Includes all recreation areas, commercial lease areas, and quasi-public development.; Acreage of all fee lands allocated for low density use. Separate from intensive use; Number of staffed information centers. Generally have an exhibit area; Number of unstaffed information centers. Generally a 'self-help' system of display and publication distribution; Total land/water acreage of COE recreation

areas as stated in Master Plan; and Number of acres in COE recreation areas developed for intensive use. (Note: Only COE managed recreation areas are included in NORSIS. This excludes areas leased to state and local governments, concessionaires, other federal agencies, etc. to avoid double-counting. The COE facility variables are self-explanatory. Each are either the number of facilities or total trail mileage located at COE recreation areas per county.)

5. Bureau of Land Management

Source Dataset: Payment in Lieu of Taxes: Fiscal Year 1995. BLM Budget and Finance Team -- report section titled "Acreage by County"; BLM Recreation Management Information System (RMIS), Version 2.2, 1994.

Acquired from: BLM Washington Office Recreation Group, Anthony Bobo (202) 452-0333. Information: BLM "Entitlement Land Acreage" published in PILT report. Best source of BLM public domain land by county; Acreage of all BLM recreation sites where sitetype is not 'dispersed use.'; Acreage of all BLM recreation sites where sitetype is 'dispersed use.'; and Sum total of the number of (various) facilities located at BLM recreation areas per county. (Note: Theoretically, every acre of BLM land should be classified as part of either a "Special Recreation Management Area" or an "Extensive Recreation Management Area". Special RMAs refer to developed sites with facilities and Extensive RMAs encompass all of the dispersed, backcountry acres. County locations for the two recreation site variables is based on BLM managers' best estimates of location and thus may differ from what the BLM Budget and Finance Team published in the PILT report. In addition, several recreation sites have missing data for county location, about 8 percent.)

6. U. S. Fish & Wildlife Service

Source Dataset: Annual Report of Lands Under Control of the U. S. Fish and Wildlife Service. As of 9/30/95 -- Report is published annually. Acquired from: FWS Division of Realty, Rebecca D. Boutz, Computer Specialist, (703) 358-1713. Information: Sum total of Refuge and WMD acres, respectively, per county; and County acreage total for only those refuges that are listed in the FWS Visitor Guide as open to public visitation.

Source Dataset: National Wildlife Refuges: A Visitor's Guide. Brochure of all Refuges and WMDs open to public. Acquired from: FWS Division of Refuges. Todd J. Logan, Refuge Program Specialist, (703) 358-1744. Also provided a directory of Refuges and their managers. Information: Each variable is the number of Refuges or WMDs possessing the specific facility or attribute per county.

7. Bureau of Reclamation

Source Dataset: Bureau of Reclamation, Recreation Areas on Bureau Projects, 1992; and Bureau of Reclamation Recreation Areas brochure, 1992. Acquired from: Bureau of Reclamation, Reclamation Service Center. Richard Crysdale, Senior Outdoor Recreation Planner, (303) 236-2722, ext. 334. Information: acres of land and water available for recreation per county for recreation areas that are managed by BuRec; acres for all BuRec properties, regardless of who manages them; and the number of BuRec Recreation Areas possessing the specific facility or attribute per county.

8. Tennessee Valley Authority

Source Dataset: Development of TVA Recreation Facilities Cumulative Through September 30,

1992; and Acreage of TVA Lands: Areas Below and Above Full Pool Level-By Counties, Sept. 30, 1987. Acquired from: TVA Reservoir Land Management, Robert A. Marker, Recreation Specialist, (423) 632-1575. Information: sum total of developed recreation area acreage per county taken from first dataset above; sum total of undeveloped TVA acreage held in fee title (not including easements), above full pool level only; and the sum total of the number of facilities located at TVA Recreation Areas per county, with the exception of the number of TVA Recreation Areas possessing trails per county.

9. National Wild and Scenic Rivers

Source Dataset: 1993 RPA Update database, data updated through June 1992. Acquired from: USDA FS. SRS 4901. Data compiled by former FS employee Mark Young. Information: Wild & Scenic River mileage managed by respective federal agencies per county. [Note: These data do not match the river mileage in a current database (November 1996) obtained from NPS Division of Park Planning and Special Studies, (John Haubert, 202-208-4290), hence their accuracy are questionable. The November 1996 report is titled "River Mileage Classifications For Components of the National Wild and Scenic Rivers System". These data are broken down by state only, not county, and could not be included in NORSIS.]

10. Nationwide Rivers Inventory 1993

Source Dataset: Nationwide Rivers Inventory 1993. Acquired from: National Park Service; National Center for Recreation and Conservation; Rivers, Trails and Greenways Assistance; Jennifer Pitt, (202) 565-1185. Information: the sum total of NRI river mileage per county; the sum total of NRI river mileage with the following respective 'outstanding remarkable values': scenic, recreational, fish, wildlife,

and historic; and the sum total of NRI river mileage classified as eligible for wild, scenic, and recreational river status, respectively. (The NRI is a comprehensive listing of the U.S.'s free-flowing, relatively undeveloped river segments with outstanding wild, scenic, or recreation potential. Does not include designated Wild & Scenic Rivers, only those eligible for and with potential for W&S classification.)

State Resources

1. Public Campgrounds

Source Dataset: Woodall's Campground Directory, 1996; American Business Information, Inc. August 1996 -- (see details on ABI database in Private Campgrounds section). Acquired from: Doug McEwen, Southern Illinois University, (618) 453-4331. McEwen received a hard-copy printout of all public and private campgrounds in the Woodall's directory with their zip codes and number of campsites (not specified as tent or trailer). Information: the sum total of public camp sites per county; the sum total of public campgrounds per county; the number of campsites must be greater than the number of campgrounds. Doug McEwen pointed out that these data on public campgrounds are incomplete. For example, for the federal agencies, many listings include only a supervisor's or district office instead of each individual campground within that district. Not sure if a similar problem exists for state-owned campgrounds; and the sum total of public campgrounds per county derived from a different data source from the first two variables. American Business Information compiles its databases from telephone yellow page and government blue page directories. It calls and confirms every listing. The listing, however, does not appear to be very complete since ABI primarily captures private businesses. Public campgrounds were pulled out of a list of all campgrounds based on the name, i.e., whether or not the name implied a public agency. Therefore, these data are of limited utility.

2. State Parks

Source Dataset: State Park Database compiled from State DNR literature and brochures. Acquired from: SRS 4901. Data compiled by John Hayes, University of Georgia graduate student, summer 1995. Information: the sum total of state park acres per county. Many of the state park brochures indicated the number of campsites and trail miles at each park, however a large percentage did not and only indicated whether or not a park had camping or hiking.

3. National Resources Inventory

Source Dataset: 1992 National Resources Inventory, USDA-NRCS. Acquired from: USDA Natural Resources Conservation Service, Fort Worth Federal Center, (817) 334-5559. Data are on 4 CDS, by region. Information: the NRI has land use and cover data for all nonfederal lands in the U.S., except Alaska; total acres in the county; the sum total of acres per county under the respective ownerships: private, municipal, county (government), state, federal, Indian/tribal, and water. Water is considered 'not owned' and is exclusive of the other ownership categories; the sum of the six ownership categories plus water; land cover is the vegetation or other kind of material that covers the land surface. Land use is the purpose of human activity on the land; it is usually but not always related to the land cover; there are 8 categories of broad land cover/use: cropland, pastureland, rangeland, forest land, miscellaneous/minor land cover/uses, Urban and built-up, rural transportation, and water; land use is defined by the NRI as the 'specific kind of activity that takes place on the land identified by the primary and secondary use'. The seven major categories of land use are: agriculture, business/commercial, recreation, residential, reserved, transportation, and waste. Wetlands is not a land use per se, but rather a special land cover important for recreation; total nonfederal wildlife-reserved land in the county; total nonfederal primary use recreation

land in the county; the sum total of county acres devoted to water-based recreation, primary and secondary uses, respectively. If desired, the sum of primary use recreation land and water would produce a county total of resources devoted primarily to recreation; there are 9 different categories of water resources, 6 for water bodies and 3 for streams. The sum of these 9 classes equals the total county water resources; and acreage enrolled in the Conservation Reserve Program as of 1993, respectively, total acres, acres located in wetlands, and acres in permanent wildlife habitat.

4. American Whitewater Affiliation Inventory of Whitewater Rivers

Source Dataset: American Whitewater Affiliation, Nationwide Whitewater Inventory. 1996. Acquired from: Downloaded from AWA's World Wide Web home page: www.awa.org, "River Pages Project". Information: the sum total of whitewater river mileage per county; and the source database is comprised of 2,297 river segments, each of which has a Class rating based on the International Scale of River Difficulty ranging from Class I (easiest) to Class VI (Extreme). River segments, however, are not usually assigned a single class rating. Instead, they tend to be assigned a range, e.g., Class I-III.

Local Resources

1. Local "Enhancement" projects funded through ISTEA: Trails and other pedestrian/bicycle facilities

Source Dataset: ISTEA Enhancement Funding Database. As of February 1996. Acquired from: Rails-to-Trails Conservancy, Bob Patten, (202) 797-5400. Information: the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 is the federal transportation bill which provided matching funds to state and local governments for transportation 'enhancements'. A number of these are of interest

and important to outdoor recreation.

2. Rail-Trails (abandoned rail lines converted to trails for recreation/transportation**)**

Source Dataset: RTC Rail-Trail Database. As of August 1996. Acquired from: Rails-to-Trails Conservancy, Hugh Morris, (202) 797-5400. Information: the rail-trail database compiled by the Rails-to-Trails Conservancy is comprised of 2,139 separate trail segments throughout the U.S.; the sum total of rail-trail miles per county; and the sum total of rail-trail miles per county that allow or are suitable for each of the indicated recreational uses. Since a given trail segment may allow multiple uses, the activity mileages do not sum to the total county rail-trail miles.

3. Federal Lands to Parks Program recreation areas

Source Dataset: Federal Lands to Parks Program (FLPP) database. As of September 1996. Acquired from: National Park Service, National Center for Recreation and Conservation, Wendy Ormont, (202) 343-3759. Information: FLPP is the federal program managed by the NPS that transfers surplus federal lands, primarily military property, to state and local governments for recreational purposes; the sum total of acres per county that have been transferred through the program since its inception in 1949; the sum total of acres transferred to state government agencies per county; the sum total of acres transferred to local government agencies per county; and the sum total of acres per county that have not completed the transfer process but are one of the following: a) deeded over to recipient, b) approved transfer, c) application approved, or d) a park or recreation agency has expressed interest in the property. Hence, these represent properties that are still pending transfer through FLPP.

4. Local government recreation and park agencies, recreation centers, and parks

Source Dataset: American Business Information, Inc. August 1996 -- see details on ABI database in Private Campgrounds section. Acquired from: American Business Information, Inc. Marketing Research, Megan Anderson, (402) 593-4532. Information: these were derived from ABI data based on Standard Industrial Classification (SIC) code 799951, "Parks". Upon examination of the names of the records, we determined that this category included listings of recreation and park departments or agencies, recreation center buildings, and parks at the local, regional and state level; the sum total of the number of agencies, recreation centers, or parks per county; and recreation departments were divided depending on their number of employees. Employee size is a good indicator of the size and scope of a department. Together they sum to give the total number of recreation and park departments per county. The sum of these departments for the entire U.S. is in the same ballpark (approximately 4,000 agencies) as the numbers in the National Recreation and Park Association (NRPA) Administrators' List and NRPA's 1993 Salary and Benefits Study.. Hence, the ABI coverage of recreation and park agencies seems to be comprehensive. Errors or omissions were possible due to the method of classifying on the basis of name.

Private Resources

1. Private Campgrounds

Source Dataset: Woodall's Campground Directory. 1996. Acquired from: Doug McEwen, Southern Illinois University, (618) 453-4331. McEwen received a hard-copy printout of all public and private campgrounds in the Woodall's directory with their zip codes and number of campsites (not specified as tent or trailer). Information: the sum total of private camp sites per county; and the sum total

of private campgrounds per county. Obviously, the number of campsites must be greater than the number of campgrounds. Private campgrounds must meet certain standards to be listed in Woodall's Directory, therefore, this database cannot be considered comprehensive. However, it is believed that it provides the best coverage of established firms whose primary business is operating a campground.

Source Dataset: American Business Information, Inc. Campground Database, SIC Codes 703301 and 703302. August 1996. Acquired from: American Business Information, Inc. Marketing Research, Megan Anderson, (402) 593-4532. Information: the sum total per county of private campgrounds (not RV) and RV campgrounds, respectively. Sum these two to get the total number of all private campgrounds; RV campgrounds were identified in the ABI database by virtue of the business name; there is a break down of all private campgrounds (non-RV and RV) into two classes based on employee size. the smallest campgrounds have less than 5 employees, while the larger campgrounds have 5 or more employees; and there are two classes based on annual sales. Campgrounds with less than $500 thousand in annual sales, and campgrounds with half a million dollars or more in annual sales.

2. Private rural land available for outdoor recreation

Source Dataset: 1995 National Private Landowner Study (NPLOS). Acquired from: SRS 4901 and Department of Agricultural and Applied Economics, UGA. Information: NPLOS was a mail questionnaire survey of rural, private individual and corporate landowners. Approximately 750 counties were sampled throughout the coterminous U.S. A total of 220 counties were excluded from sampling consideration because they were either considered 'urban' or 'public lands' counties. Exclusion was based on these criteria: 1) Urban-- population density greater than or equal to 500 persons per square mile. Also, counties with a density between 300 and 500 were excluded if a relatively small amount of rural, nonpublic land was present (less than 140,000 acres in the eastern U.S. and less than 250,000 acres in the western

U.S.); and 2) Public lands-- counties having 70 percent or more of their land in federal public ownership. There are four varying degrees of access to private lands for outdoor The four levels of access are: a) acres of land open only to family and friends for outdoor recreation; b) acres of land leased to individuals or groups for outdoor recreation; c) acres of land open to the general public for outdoor recreation; and d) acres of land closed to public access for outdoor recreation. Estimates for these were derived for 2,846 U.S. counties. An additional 45 counties that were classified as 'public lands' counties and excluded from sampling were later assigned estimates based on the amount of rural, nonfederal land and the Bailey's ecoregion division in which they were located. Urban counties were judged to have none or very little rural, private land available for outdoor recreation and were thus assigned 0 acres.

3. Private forest land

Source Dataset: Private Forest Land Owners of the United States, 1994. Note: See also Resource Bulletin NE-134, T.W. Birch, same title, descriptive tables and text based on these data. Acquired from: Tom Birch, USDA-FS Northeastern Forest Experiment Station, (610) 975-4075. Information: the Birch Private Forest Lands Study sent questionnaires to 23,334 owners of 28,194 forest plots in the U.S. A total of 11,742 ownerships of 15,697 plots responded. In addition to studying forest land ownership, the study also describes ownership objectives, expected benefits, harvest experience and intentions, and management planning; sum total of private forest land acres in the county; sum total of private forest ownership units in the county; and for the entire U.S., the Birch study estimates there are 393.4 million acres of private forest land and 9.91 million ownership units. The following is a break down of the acreage and ownership units: acres of private forest owned by individuals; acres of private forest owned by partnerships; acres of private forest owned by corporations; acres of private forest owned by other; number of private forest units owned by individuals; number of private forest units owned by partnerships; number of private forest units owned

by corporations; and number of private forest units owned by other.

The following is a break down of outdoor recreation on private forest land: acres of private forest land owned by sport or recreation clubs; acres of private forest woodland used for recreational purposes; acres of private forest woodland that are posted; acres of private forest woodland posted to control or prohibit access; acres of private forest woodland owned primarily for recreation; acres of private forest woodland where recreation was a primary benefit during the last 10 years; and acres of private forest woodland where recreation is an expected benefit over the next 10 years.

4. The Nature Conservancy preserves and tracts

Source Dataset: The Nature Conservancy: Managed Area Basic Record (MABR) Database and TRACTS Database. January 1997. Acquired from: The Nature Conservancy, Christen Comstock or Adrianne Burk, (703) 841-5300. Information: The Nature Conservancy organizes data on its properties into "Managed Area Basic Records". These are created for the purpose of "identifying and characterizing natural areas of land under distinct protective or potentially protective management; a Managed Area (MA) is usually under some formal or legal level of protection and may be managed in accordance with some unified set of stewardship plans." ; each MA is comprised of tracts. The tracts that make up an MA may be owned by TNC alone, by a single landowner, or by multiple landowners; not all tracts in an MA are fully protected, rather they may be candidates for protection; the purpose of including these properties in NORSIS is to recognize natural areas, especially those which grant public access presumably for outdoor recreation. The following are descriptive statistics of TNC Tracts, which have been identified as distinct and part of an MA. The data refer to all tracts, regardless of ownership; sum total of TNC tract acres per county identified as an MA; TNC tract acres that allow public access; TNC tract acres with restricted or unknown public access; TNC tract acres with full protected status; TNC tract acres with semi-protected or

unknown status; TNC tract acres with unprotected status; TNC tract acres in established preserves (may be TNC, state heritage programs or other formal preserves); TNC tract acres managed by TNC; and TNC tract acres managed by other agencies.

5. Recreation Businesses

Source Dataset: American Business Information, Inc. Marketing Research Database of recreation businesses based on SIC codes. Acquired from: American Business Information, Inc. Marketing Research, Megan Anderson, (402) 593-4532. Information:

Recreation Business	SIC Code	Amusement Places	799601
Hunting & Fishing Preserves	097101	Recreation Centers (private)	799701
Marinas	449306	Tennis Courts-Private	799703
Cruises	472406	Swimming Pools-Private	799704
Tours-Operators & Promoters	472501	Fishing Lakes-Private	799709
Skiing Tours	472502	Hunt & Fish Clubs	799716
Expeditions-Outfitted	472503	Archery Ranges	799903
Bike Tours	472507	Baseball Batting Ranges	799908
Skiing Centers/Resorts	701110	Bicycle Rentals	799909
Fishing Camps	703201	Boats-Rental & Charter	799913
Dude Ranches	703202	Boating Instruction	799914
Camps	703203	Canoe Trip Outfitters	799917
Golf Courses-Public	799201	Canoes-Rental & Charter	799918
Golf Courses-Private	799706	Fairgrounds	799923

Diving Instruction	799924	Sightseeing Tours	799963
Fishing Piers	799925	Skiing Equipment-Rental	799964
Fishing Lakes-Public	799926	Stables	799968
Fishing Parties	799928	Swimming Pools-Public	799969
Golf Courses-Miniature	799929	Tennis Courts-Public	799971
Golf Practice Ranges	799931	Trap & Skeet Ranges	799975
Guide Service	799934	Water Equipment-Rental	799980
Historical Places	799940	Fishing Lakes & Ponds	799983
Picnic Grounds	799954	Raft Trips	799986
Playgrounds	799956	Scuba Diving Tours	799987
Riding Academies	799957	Hunting Trips	799992
Rifle & Pistol Ranges	799960		
Sailing Instruction	799961		

Each of the ABI variables is simply the sum total of the number of recreation business firms per county. Note: ABI assigns the fifth and sixth digit to the standard 4-digit SIC code. For example, there are over 90 entries under SIC code 7999, "Miscellaneous Recreation and Amusement Services". The U.S. Department of Commerce groups these businesses all together under 7999, but ABI assigns a code (the 5th and 6th digits) which specifies the recreation business. There are five categories of tourist attractions: Natural resource-based attractions; Amusement/entertainment/sports attractions; Historic/cultural attractions; Government/civic attractions; Other unclassified attractions. Further details on tourist attraction classifications: 1) Natural resource-based: Includes anything related to natural resources like nature preserves, wildlife sanctuaries, forests, parks, etc. Also include tours or guide services, such as

sightseeing tours, boat rides, fishing boats, etc. that depend on natural resources. Also zoos, aquariums, nature centers or any business that is directly dependent on nature or the outdoors; 2) Amusement/Entertainment/Sports: The largest category, it includes all the visitor attractions, primarily commercial in nature, that are not resource-based, historical/cultural, or civic/public (like memorials and monuments). Also includes shopping, outlet malls and the like; 3) Historic/Cultural/Arts/Festivals: Includes anything that has to do with history, heritage, culture, the arts, fairs, festivals, etc. Most items that are not resource-based or designed for entertainment value will probably belong here so long as they are not government, civic, memorial, etc. attractions; 4) Government/Civic/Monuments/Memorials: Includes anything that is publicly owned or provided by government. An exception is a state park which belongs in category 1. A local or city park, however, belongs here. Also includes organizations like Chambers of Commerce or Merchants Associations; and 5) Other: Any other attraction that does not fit into one of the four categories above.

6. Cross Country Skiing

Source Dataset: Cross Country Ski Areas Association Database. September 1996. Acquired from: Cross Country Ski Areas Association (CCSAA); Winchester, NH. Chris Frado, (603) 239-4341. Information: the CCSAA defines cross country skiing firms or centers as having four essential components: a) professional ski school and staff, b) ski shops with rental equipment, c) groomed and marked trails, d) base lodge with amenities; the sum total of skiing firms or centers per county; the number of public skiing centers per county based on the name of the center in CCSAA's database, e.g. one provided by a county recreation and parks department; the number of firms with backcountry skiing; and the sum total of groomed trail mileage per county.

7. Alpine Skiing

Source Dataset: The White Book Industry Edition, Ski Area Statistics, 1997. Acquired from: Inter-Ski Services, Inc.; Washington, DC; Bob Enzel, (202) 342-0886. Information: sum total of the number of downhill skiing areas per county; sum total of 'Skiable acreage' (not total) per county; average vertical drop at ski areas per county; average top elevation @ highest lift per county; total vertical transfer feet (millions) per county; number of destination resorts per county--has slopes and facilities that attract skiers from great distances for major vacations; number of regional resorts per county--has slopes and facilities that attract skiers from the region for a resort vacation; number of local resorts per county--has slopes that generally attract local skiers on vacation and those who want to ski at a nearby resort; number of privately owned ski resorts per county; and number of publicly owned ski resorts.

Other Resource and Socioeconomic Descriptor Variables

1. Bailey's Ecoregions and Divisions

Source Dataset: Bailey's Ecoregion Database: Acreage by County, 1994. Acquired from: John Hof, USDA-FS Rocky Mountain Forest and Range Experiment Station, (970) 498-1859. Information: each U.S. county is characterized by one or more 'ecoregions' (3-digit) according to Robert Bailey's Ecosystem Classification database; most counties are located within a single ecoregion. In that case, the acreage for the corresponding ecoregion variable should approximately equal the total county acreage; and the sum total of mountainous acres in the county.

2. Economic Research Service (ERS) County Typologies and Rural/Urban Continuum

Source Dataset: ERS County Typologies, 1989; and ERS Rural/Urban Continuum Code. Butler: 1983, Beale: 1993. Acquired from: USDA-ERS World Wide Web Homepage: http://www.econ.ag.gov. Rural Economy Division.

Information: (Note--The following is copied verbatim from ERS Documentation. Some minor details are omitted here; if necessary, refer to WWW page.) 1989 ERS County Typology Codes: the 1989 classification system of nonmetro counties, known as the ERS typology, is designed to provide policy-relevant information about diverse rural conditions to policymakers, public officials, and researchers. The classification is based on 2,276 U.S. counties (including Alaska and Hawaii) designated as nonmetro as of 1993. The typology includes six mutually exclusive economic types: five types (farming, mining, manufacturing, government and services) reflect dependence on particular economic specializations; a sixth type, termed nonspecialized, contains those counties not classified as having any of the five economic specializations. The classification scheme also identifies five overlapping rural policy-relevant types: retirement-destination, Federal lands, persistent poverty, commuting and transfers-dependent. For additional information or technical advice, please contact: Peggy Ross Cook, Senior Sociologist, Office of the Director/RED/ERS/USDA, 1301 New York Avenue, NW, Washington, DC 20005-4788, (202) 219-0095.

1989 County economic type definitions (coded 0/1, 8 indicates a metropolitan county):

- Farming-dependent - Farming contributed a weighted annual average of 20 percent or more labor and proprietor income over the three years from 1987 to 1989.
- Mining-dependent - Mining contributed a weighted annual average of 15 percent or more labor and proprietor income over the three years from 1987 to 1989.
- Manufacturing-dependent - Manufacturing contributed a weighted annual average of 30 percent or more labor and proprietor income over the three years from 1987 to 1989.

- Government-dependent - Government activities contributed a weighted annual average of 25 percent or more labor and proprietor income over the three years from 1987 to 1989.
- Services-dependent - Service activities contributed a weighted annual average of 50 percent or more labor and proprietor income over the three years from 1987 to 1989.
- Nonspecialized - Counties not classified as a specialized economic type over the three years from 1987 to 1989.

Policy Types:

- Retirement destination - The population aged 60 years and over in 1990 increased by 15 percent or more from 1980-90 through in-movement of people.
- Federal lands - Federally-owned lands made up 30 percent or more of a county's land area in the year 1987.
- Commuting - Workers aged 16 years and over commuting to jobs outside their county of residence were 40 percent or more of all the county's workers in 1990.
- Persistent poverty - Persons with poverty-level income in the preceding year were 20 percent or more of total population in each of four years, 1960, 1970, 1980, and 1990.
- Transfers-dependent - Income from transfer payments (Federal, state, and local) contributed a weighted annual average of 25 percent or more of total personal income over the three years from 1987 to 1989.

Removal of overlaps for economic types: Counties that qualified as farming, mining, or manufacturing types AND also qualified as government and/or services counties were assigned to the farming, mining, or manufacturing types, respectively. Other overlaps such as farming-manufacturing, mining-manufacturing, farming-mining or government-services were assigned to the type with the largest percentage point difference above the cutting point divided by the standard deviation.

! Rural/Urban Continuum: Devised by ERS Sociologist Margaret Butler in 1983 to categorize U.S. counties on a scale from most urban to most rural. Codes 0 to 3 identify metropolitan counties and codes 4 to 9 nonmetropolitan. Butler's codes were based on 1980 Census Data. ERS Demographer Calvin Beale used the same continuum on 1990 Census data.

Code:

! METROPOLITAN COUNTIES (0-3)

0 Central counties of metropolitan areas of 1 million population or more

1 Fringe counties of metropolitan areas of 1 million population or more

2 Counties in metropolitan areas of 250,000 - 1,000,000 population

3 Counties in metropolitan areas of less than 250,000 population

! NONMETROPOLITAN COUNTIES (4-9)

4 Urban population of 20,000 or more, adjacent to a metropolitan area

5 Urban population of 20,000 or more, not adjacent to a metropolitan area

6 Urban population of 2,500-19,999, adjacent to a metropolitan area

7 Urban population of 2,500-19,999, not adjacent to a metropolitan area

8 Completely rural (no places with a population of 2,500 or more) adjacent to a metropolitan area

9 Completely rural (no places with a population of 2,500 or more) not adjacent to a metropolitan area

3. IMPLAN Resource Dependence Typology: Tourism and Forest Product Industries

Source Dataset: IMPLAN Resource Dependence Typology Dataset, 1992 data. Acquired from: SRS 4901, Don English. Information: 1) SRS 4901 Resource Economist Don English constructed this database to indicate the resource dependence of each county's economy on the tourism and forest product

industries. Six different factors variables each of 12 different economic resource dependence 'types' for a total of 72 variables. The six variables are each expressed in millions of dollars with the exception of the number of jobs: 1) employee compensation; 2) indirect business tax; 3) proprietor income; 4) other property income; 5) total industrial output; and 6) number of jobs; 2) the 12 economic types are described below. Each variable is not defined here; the variable labels above are sufficient to indicate the definition.

Economic Sectors:

```
**********************************************
***  RESOURCE DEPENDENCE TYPOLOGY :       ****
***    0 = OTHER
****  1 = TIMBER PRODUCTION
****  2 = LOGGING AND RELATED SERVICES
****  3 = PRIMARY WOOD PROCESSORS
****  4 = SECONDARY WOOD PROCESSORS
****  5 = EAT/DRINK ESTABLISHMENTS
****  6 = HOTELS AND ACCOMMODATIONS
****  7 = RELATED RETAIL
****  8 = TOURISM SERVICES
****  9 = SUPPORT SERVICES
**** 10 = REAL ESTATE
**** 11 = CONSTRUCTION, RESIDENTIAL
**********************************************;
```

More detailed IMPLAN sector definitions (with IMPLAN Sector Number) for each of these general resource dependence sectors are:

! 0. Other

-- all other sectors not included in the 11 resource dependence types

! 1. Timber Production

-- forestry products (24)

-- agricultural, forestry, fishery services (26)

! 2. Logging and Related Services

-- Logging Camps and Logging Contractors (133)

! 3. Primary Wood Processors

-- Sawmills and Planing Mills, General (134)

-- Hardwood Dimension and Flooring Mills (135)

-- Special Product Sawmills, not easily classified (136)

-- Millwork (137)

-- Wood Kitchen Cabinets (138)

-- Veneer and Plywood (139)

-- Structural Wood Members, not easily classified (140)

! 4. Secondary Wood Processors

-- variety of building, household, furniture, paper and other wood products (141-173)

! 5. Eating and Drinking Establishments

-- Eating and Drinking (454)

! 6. Hotels and Accommodations

-- Hotels and Lodging Places (463)

! 7. Related Retail

-- Miscellaneous Retail (455)

! 8. Tourism Services

-- Theatrical Producers, Bands, etc. (484)

-- Bowling Alleys and Pool Halls (485)

-- Commercial Sports except Racing (486)

-- Racing and Track Operation (487)

-- Amusement and Recreation Services, not easily classified (488)

-- Membership Sports and Recreation Clubs (489)

! 9. Support Services

-- Food Stores (450)

-- Automotive Dealers and Service Stations (451)

-- Automobile Rental and Leasing (477)

! 10. Real Estate

-- Real Estate (462)

! 11. Construction, Residential

-- New Residential Structures (48)

-- Maintenance and Repair, Residential (55)

4. Climatological and Geographic Data

Source Dataset: 1987 NORSIS, compiled for the 1989 RPA Assessment. Acquired from: SRS 4901. Compiled in mid-1980s by Don English. Information: the latitude and longitude of the county centroid are unchanged from the 1987 NORSIS and do not need to be updated.

5. U. S. Census Bureau Data

Source Dataset: USA Counties 1996. U.S. Census Bureau, CD-ROM. Acquired from: U.S.

Census Bureau. Customer Services, (301) 457-4100. Information: All data from USA Counties 1996 CD. CD has hundreds of variables on variety of subjects; these were selected as most probable to be used in demand and participation modeling.

Definitions of State Park Inventory and Facilities

(Source: National Association of State Park Directors. Annual Information Exchange 1996.)

Inventory

Inventory pertains to the real property assets of a state park system, i.e. the various areas of land and water managed directly by the state parks agency. Inventory is measured in terms of number of areas and total acreage.

Areas are individual units, or pieces of property, managed as part of the state park system.

The total acreage of a state park system includes water surface area only when the measured water bodies are wholly enclosed within the boundaries of a unit of the state park system.

An operational area is one that is open for regular use by the visiting public, and normally implies an appropriate level of development and staffing.

State park inventories are reported in the following defined categories:

- State Parks: Areas containing a number of coordinated programs for the preservation of natural and/or cultural resources and provision of a variety of outdoor recreation activities supported by those resources.
- State recreation areas: Areas where a clear emphasis is placed on the provision of opportunities for primarily active recreation activities.
- State natural areas: Areas where a clear emphasis is placed on protection, management and interpretation of natural resources or features.
- State historical areas: Areas where a clear emphasis is placed on protection, management and interpretation of historical and/or archaeological resources or features.

- State environmental education sites: Areas used exclusively or primarily for conducting educational programs on environmental subjects, natural resources, conservation, etc.
- State scientific areas: Areas set aside exclusively or primarily for scientific study, observation and experimentation involving natural objects, processes and interrelationships; any other allowable uses are secondary and incidental.
- State forests: Areas that, while under the direct administrative supervision and control of the state parks agency, are identified separately from the state park system and distinguished from state park units by having primarily a forest management and/or timber production role rather than a natural area and/or provision of recreation role.
- State fish/wildlife areas: Areas under the administrative supervision and control of the state parks agency that are identified and managed primarily for the propagation and recreational taking of fish and/or game ("fishing and/or hunting areas").
- Other specified areas: Areas other than the above, that are considered special or significant enough in a particular state to warrant separate identification and treatment.
- Miscellaneous areas: Areas other than the above, that are not easily categorized or distinguished, or are not considered significant enough to warrant specification-"everything else".

Facilities

Facilities are the man-made structures and improvements provided on state park areas to facilitate appropriate use of the parks by the visiting public. While these facilities take many forms for many different purposes, twelve of the more common types have been selected for inclusion in this report. The NASPD AIX tabulates the number of separate state park areas offering such facilities, as well as the total number of such facilities, broken down by year-around and seasonal availability. They are described and

defined as follows:

Campsites, improved are designated sites with access to electricity, running water and modern toilets, either through hook-ups or central facilities, or both.

Campsites, primitive are designated sites without access to utilities, other than primitive central restrooms (pit privies, holding tanks, etc.) and primitive water supply (pitcher pumps, etc.).

Cabins/cottages include individual, self-contained rental lodging units, usually free-standing, but possibly in multiple arrangements, such as duplexes or "townhouses".

Lodges are lodging facilities of varying size, but usually containing many rental units consisting primarily of sleeping rooms only, with either private or central bathrooms.

Lodge rooms are classified as independent sleeping rooms or suites within a lodge that may be rented by themselves.

Golf courses containing at least nine regulation or "par 3" holes. This section also includes *golf holes*.

Marinas are boat liveries containing multiple slips and providing at least some services (fuel, supplies, repairs, dry storage, etc.), as opposed to "docks" only.

Swimming pools of various sizes and shapes with an impermeable basin and a chemically treated, recirculating water supply, are available for general public use with or without a separate fee.

Stables for quartering horses for recreational use by the general public, either directly through rental of the horses themselves or indirectly through rental of the stalls.

Ski slopes include individual slopes, or "runs" designated for independent concurrent use for down-hill skiing.

Methods for study of State Trail Administrators, R. Moore (1994)

The article in Chapter III on State Trails Programs by Moore and Ivy is based on a study of state trail administrators conducted by Moore in 1994[1]. At that time the state trail administrator(s) of every state as well as the District of Columbia and Puerto Rico were surveyed (Bicycle and pedestrian coordinators were not included). Because California, Arizona, and Utah operated separate motorized and nonmotorized trail programs, the administrator of each was included. The unit of analysis for the study, therefore, was trail programs rather than states. Fifty-three trail programs responded, including the state trail programs from 48 states (Louisiana and Wyoming did not respond), the additional motorized trail programs from the three states noted above, and the trail programs from the District of Columbia and Puerto Rico. For the purposes of this study and this paper, a trail was considered any designated off highway, land-based route open to the public. Respondents were asked to consider trails on both public and private lands (even if a fee was charged) and trails for any allowable trail use whether motorized or nonmotorized. Backcountry trails and snowmobile trails were included even if only open during parts of the year, as were multi-purpose "greenway" trails, rail-trails regardless of surface, and unimproved roads if designated for trail use. Respondents were asked not to consider bicycle lanes or routes that followed highways.

List of States in the National Recreation and Park Association (NRPA) regions
(Source: PKF Consulting, 1995)

Northeast Region

[1]Moore, R. L. (1994). State Trail Programs: A Survey of State Trail Administrators. Denver, CO: The National Association of State Trail Administrators. Available c/o Colorado State Trails Program, 1313 Sherman St., Room 618, Denver, CO 80203.

Connecticut
Maine
Massachusetts
New Hampshire
New Jersey
New York
Pennsylvania
Rhode Island
Vermont

North Central Region

Illinois
Indiana
Iowa
Kansas
Michigan
Minnesota
Missouri
Nebraska
North Dakota
Ohio
South Dakota
Wisconsin

South Region

Alabama
Arkansas
Delaware
Florida
Georgia
Kentucky
Louisiana
Maryland
Mississippi
North Carolina
Oklahoma
South Carolina
Tennessee
Texas
Virginia
West Virginia

West Region

Alaska
Arizona
California
Colorado
Hawaii
Idaho
Montana
Nevada
New Mexico
Oregon
Utah
Washington
Wyoming

Development of the Supply Indexes for Recreation

Previous Research

Site specific studies of recreation demand–Knetsch et al. (1976) created a substitution index for a set of lakes in California. Their index was created by summing the ratio of the logarithm of lake acres to

travel distance from the individual's home to the substitute lake. However, summation for was done only over the lakes whose ratios were greater than the one under study.

Wetzstein and Green (1978) examined recreation demand for wilderness and wilderness study areas in California. For one regressor in their zonal TCM, they constructed several substitute wilderness recreation opportunity proxies based on principal component indices of wilderness areas attractiveness, and one based on wilderness area size alone. Their opportunity proxy, AI_i, for an origin I was calculated as:

$$AI_i = \sum_{\substack{j=1 \\ j \neq k}}^{J} (A_j/d_{ij})/(A_k/d_{ik}) \qquad \textbf{(1)}$$

where A_j is a principal components attractiveness index for wilderness j, d_{ij} is the distance from origin I to wilderness j, and k is the site under consideration. In their models, the proxies all preformed well, including the opportunity proxy based on wilderness acreage alone. Wetzstein and Green concluded that acreage can account for most of the attractiveness of a wilderness area.

Mullen and Menz (1985) constructed a general index of resource availability for fishing in the Adirondacks for each of three types of fishing resources: coldwater lakes, other lakes, and streams. Their accessibility index value for any fish resource type, AI_i, for any origin I was:

$$AI_i = \sum_{k=1}^{n} A_k/P_{ik} \qquad \textbf{(2)}$$

where A_k is surface water acres of the fish resource type for site k, and P_{ik} is the round-trip travel cost from origin I to site k. Travel costs were defined as 10 cents per mile plus travel time valued at 35% of the wage

rate. They found that aggregate seasonal days of participation was related to the 'own' accessibility index for each type of fishing.

Rosenthal (1987), and Hof and Rosenthal (1987) used a substitute index to predict trips to 11 reservoirs in Kansas and Missouri. Their index was based on a principal component analysis of the matrix of distances separating each origin from each of the 35 substitute reservoirs within a 200-mile distance. Components with eigenvalues greater than one were retained for inclusion in the demand equation. Results indicated these components were significant predictors of recreation demand.

Regional/national assessments of recreation–Hof and Kaiser (1983) developed recreation participation projections based on 1977 national survey data for participation. Their independent variables included demographics, and unspecified 'supply availability' variables. While it is not possible to determine what the supply variables were, nor how they were derived from resource counts, their results show that participation projections are tied to resource availability.

Walsh, et al. (1992) developed participation models for fish and wildlife recreation. Probability of participation was predicted as a function of demographic, price, and resource availability variables. In this study, two resource availability variables were used: (a) millions of acres of fishable water per capita in the individuals home state; (b) millions of acres of forest, range, and pasture land, both public and private, per capita in the individual's home state.

Bergstrom and Cordell (1991) used an index of substitute opportunities for each of 12 different recreation resource categories. Begin with a resource index (RI) for a county, which equals the weighted sum of the ratios of several component resources to county population, where weights were provided by an expert panel, and the weighted sum is indexed to the 95th percentile of observed sums over all counties. The index of substitutes for any resource within a county is the average of the index for the other 11 resource categories. Their final substitute opportunity index is:

$$OI_i = \frac{\sum_j RI_j(1-(\frac{d_{ij}}{d_{MAX}}))}{\sum_j (1-(\frac{d_{ij}}{d_{\max}}))} \quad \textbf{(3)}$$

where RI_j is the resource index for county j, d_{ij} is the distance between counties I and j, d_{MAX} is the maximum distance individuals are willing to travel to use the resource category, and the index for j is over counties that are not more than d_{MAX} from county I.

Based on these research efforts, we developed a set of availability measures for recreation-related resources. These measures describe the availability of resources, relative to the distribution of both the resources themselves and the population that makes use of them.

Data and Analysis

From a candidate set of over 200 individual recreation resource variables, we selected 51 from which to develop our indices (Table 1). These were selected primarily based on resources included in developing supply measures for the research cited above. Variables were classified according to whether they were related to developed facilities, or land, water, or winter recreation resource bases.

Factor analyses were used to simplify the resource base structure. First, factor analyses (principal components analysis with varimax rotation) were performed on each subgroup of variables. Following convention, factors with eigenvalues greater than one were retained. There were a total of fourteen factors,

including two for each developed and winter resources, six for dispersed land, and four for water resources. Factors were also determined for the full set of 51 variables. The two sets of factors were nearly identical, in number of factors, in percent of variation explained by the factors, and on loadings of variables onto the factors. The results of the first analysis were easier to report, and thus were used to develop the availability measure. Tables 2 through 5 report the results of the factor analyses for each of the four subgroups of resource variables. Table 6 provides an interpretation for the types of recreation resources identified in each of the 14 factors.

Factor scores (mean=0, s.d.= 1) were calculated for each factor for each county. These scores summarize the relative availability of resources for that factor within that county. However, the resources within a county do not fully describe the set of recreation resources available to residents of that county. All of the research cited above used a much wider geographic range than a single county to describe supply availability measures, and most included some weight that declined with increasing distance. Following Rosenthal (1987) we selected a 200-mile cutoff as a market area for each county. Recreation resources further away than that were considered too distant to be important in determining recreation opportunities. In addition, both Bergstrom and Cordell (1991) and Walsh et al. (1992) note the importance of accounting for population pressures on the resources.

Our availability measure started with the summed distance-weighted factor score over the set of counties within 200 miles. To account for population pressures, the summed factor score was divided by the population (in millions) within the same set of counties. The supply availability is:

$$SA_{ik} = \frac{\sum_{j=1}^{N} F_{jk} d_{ij}^{\alpha})}{\sum_{j=1}^{N} POP_j d_{ij}^{\alpha}}$$

Sa_{ik} = supply availability measure for county I and resource factor k;

F_{jk} = factor score for county j and resource factor k;

POP_j = population in thousands for county j;

d_{ij} = distance separating counties I and j;

α = distance decay parameter;

N indexes counties with centroids < 201 mi. of county I.

Availability measures were calculated using several different parameters for α, including values of 2.0, 1.0, 0.5, and 0.0. It was not clear what the most appropriate parameter would be. Gravity model literature provides examples of each of these four. A number of previous recreation studies have used 1.0 when dealing with distances (Knetsch, et al., Wetzstein and Green, Bergstrom and Cordell). Rosenthal used a linear decay (α=1.0), but converted distance to cost by multiplying by $.10. On the other hand, Walsh, et al., used a zero weight for all resources and population within the state. It was decided to select the parameter empirically from among this candidate set.

For each parameter value, the appropriate set of supply availability measures were used in logit regression models explaining recreation participation for specific activities including developed camping, picnicking, canoeing, swimming, and skiing. Demographic variables including age, income, race, gender, and residence made up the other explanatory variables. In each case, the best model fit occurred when using zero as the distance decay parameter. As a result the supply measure for any county accounts equally for all resources and population within 200 miles of the county centroid.

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Table 1–Resource variables used to develop availability measure

Developed facilities:

ABIPARKD = ABI # parks & rec depts
ABITOUR = ABI # tour operators + sightseeing tour OPERATORs
ABIPLAY2 = ABI # playgrounds + ABI # recreation centers
ABISWIM2 = ABI # private +public swimming pools
ABITEN2 = ABI # private + public tennis courts
ABICAMPS = ABI # organized camps
ABITATT2 = ABI # tourist attr. + ABI # historical places
ABIAMUSE = ABI # amusement places
ABIFAIR = ABI # fairgrounds
ABIPKLOC = ABI # local, county or regional parks
ABIGOLF2 = ABI # private + public golf courses
ISTEAGW = # ISTEA funded greenway trails
nriurban = estimate of acres of urban and built up land
pop95 = estimated county population in 1995

Dispersed Land resources:

ABIGUIDE = ABI # guides services
ABIHUNT2 = ABI # hunting/Fishing preserves + clubs + lodges
ABICGPRI = ABI # private campgrounds
BLMPDAC = BLM public domain acres
BLYMTNS = Bailey: Acres of mountains
PVTAGAC = NRI cropland + pasture + range acres
FSACRE = USDA-FS Forest + Grassland acres
FWSRECAC = FWS refuge acres open for recreation
CGPRISIT = WOODALLS # private campground sites
CGPUBSIT = WOODALLS # public campground sites
NPSFED = NPS federal acres
NRIFOR = NRI forest acres
OFEDAC = BuRec-managed ac + TVA undev + rec ac + COE ac
RTMILES = RTC total rail-trail miles
SPACRES = State Park acres
TBACRES = Birch: acres of private forest land
TNCPUB = TNC acres with public access
WILDALL = NWPS acreage: Total 1993

Table 1 (continued)–Resource variables used to develop availability measure

Water resources:

ABIMARIN = ABI # MARINAS
ABICANO2 = ABI # canoe outfitters + rental firms+ raft trip firms
ABIDIVE2 = ABI # diving instruct/tours + snorkel outfitters
ABIGUIDE = ABI # guides services
ABIFISH2 = ABI # fish camps + pvt/public fish lakes,piers,ponds
AWAMILES = AWA total whitewater river miles
WSRALL = Wild & Scenic River miles: Total 1993
FLATWATR = NRI water 2-40,<2 ac, >= 40 ac(lake)or(reserv.)
RUNWATER = NRI stream<66' wide + 66-660' wide + >=1/8 mi wide
BAYEST = NRI water body >= 40 ac.:bay, gulf,estuary
NRIWETL = NRI wetland acres
RIVMILES = NRI Total river miles, outstanding value

Winter resources:

CCSFIRM2 = CCSAA # XCski firms+ public XC centers
DSKIACRE = ISS Skiable acreage
SNOWLAND = SNOWDUM*(NPSFED+FSACRE+FWSRECAC + BLMPDAC + SPACRES)
SNOWAG = SNOWDUM *(NRICROP + NRIPAST + NRIRANGE)
SNOWTRAL = SNOWDUM* (ISTEAGW + RTMILES)
snowmtn = snowdum * blymtns
snowfor = snowdum * nrifor

Table 2–Factor analysis results for developed facility resource variables

Rotated Factor Pattern

	FACTOR1	FACTOR2
ABIPARKD	0.78348	0.34733
ABITOUR	0.79911	0.02688
ABIPLAY2	0.76275	-0.09027
ABISWIM2	0.47702	0.35815
ABITEN2	0.85166	0.19872
ABITATT2	0.59037	0.14739
ABIAMUSE	0.84200	0.27505
NRIURBAN	0.85792	0.36646
ABIFAIR	-0.03609	0.53713
ABIPKLOC	0.79856	-0.02349
ABIGOLF2	0.73754	0.45099
ABIRIDE2	0.82177	0.25654
ABICAMPS	0.72176	0.20167
ISTEAGW	0.26502	0.65921
RTMILES	0.10811	0.61188
POP95EST	0.92897	0.17609
Eigenvalue	8.6630	1.2096
Proportion	0.5414	0.0756
Cumulative	0.5414	0.6170

Standardized Scoring Coefficients

ABIPARKD	0.07245	0.09355
ABITOUR	0.14429	-0.15154
ABIPLAY2	0.16265	-0.23210
ABISWIM2	0.01257	0.16761
ABITEN2	0.11721	-0.03322
ABITATT2	0.07918	-0.01575
ABIAMUSE	0.09898	0.02644
NRIURBAN	0.08232	0.09197
ABIFAIR	-0.12227	0.41295
ABIPKLOC	0.15502	-0.18943
ABIGOLF2	0.04153	0.18163
ABIRIDE2	0.09916	0.01682
ABICAMPS	0.09218	-0.00306
ISTEAGW	-0.09197	0.44030
RTMILES	-0.11126	0.43833
POP95EST	0.13659	-0.06692

Table 3–Factor analysis for dispersed land resources

Rotated Factor Pattern

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5	FACTOR6
ABIGUIDE	0.69387	0.06383	0.03094	-0.11547	0.20904	0.01791
ABIHUNT2	-0.02583	-0.12042	0.02065	0.04476	0.66575	-0.06207
BLMPDAC	0.22400	0.35854	-0.08774	0.63178	-0.07190	0.05632
BLYMTNS	0.75395	-0.08408	0.32435	0.31528	-0.18111	0.01650
PVTAGAC	0.17464	-0.07249	-0.21052	0.71599	0.10036	0.08917
FSACRE	0.82423	-0.08289	0.19196	0.26581	-0.15997	0.00113
FWSRECAC	0.11168	0.79561	-0.04116	0.11837	0.07803	0.02476
CGPUBSIT	0.19124	0.09194	0.09336	0.06592	0.39075	0.53580
NPSFED	0.51199	0.25144	-0.19142	0.08965	0.22927	0.08012
CGPRISIT	0.20923	0.33828	0.19958	0.05165	0.53095	0.11375
OFEDAC	-0.06587	-0.02769	0.01520	0.02756	-0.13161	0.86902
RTMILES	0.09157	0.00747	0.60926	-0.09560	0.28169	0.04423
SPACRES	-0.17867	0.07899	0.45362	0.47252	0.19152	-0.14772
TNCPUB	-0.02535	0.78126	0.07438	-0.00627	-0.07051	-0.01589
WILDALL	0.83294	0.11911	0.02344	0.04276	0.07821	0.01583
NRIFOR	0.16635	0.01474	0.76119	-0.13586	-0.11259	0.07429

	1	2	3	4	5	6
Eigenvalue	3.4488	1.6364	1.4620	1.1066	1.0389	1.0003
Proportion	0.2155	0.1023	0.0914	0.0692	0.0649	0.0625
Cumulative	0.2155	0.3178	0.4092	0.4784	0.5433	0.6058

Standardized Scoring Coefficients

	FACTOR1	FACTOR2	FACTOR3	FACTOR4	FACTOR5	FACTOR6
ABIGUIDE	0.29084	-0.00258	-0.08611	-0.22731	0.15385	-0.03497
ABIHUNT2	-0.03091	-0.15573	-0.04027	0.04481	0.59818	-0.10023
BLMPDAC	-0.02729	0.16628	-0.04192	0.44247	-0.11717	0.01907
BLYMTNS	0.22342	-0.10410	0.18713	0.16293	-0.20803	-0.02329
PVTAGAC	-0.03351	-0.14865	-0.14135	0.55498	0.09044	0.05396
FSACRE	0.27679	-0.10435	0.07581	0.10063	-0.17743	-0.03939
FWSRECAC	-0.01247	0.50224	-0.03751	-0.01057	-0.02375	-0.01645
CGPUBSIT	0.01111	-0.01512	0.00640	-0.00351	0.27880	0.45311
NPSFED	0.19358	0.10347	-0.21731	-0.06104	0.16822	0.02354
CGPRISIT	0.01506	0.14844	0.07792	-0.02981	0.39340	0.04166
OFEDAC	-0.07526	-0.03139	0.01844	0.01893	-0.17275	0.81852
RTMILES	-0.02885	-0.01739	0.40740	-0.06327	0.18530	0.00851
SPACRES	-0.21155	-0.00201	0.37328	0.44588	0.12320	-0.16277
TNCPUB	-0.05324	0.53136	0.07053	-0.07729	-0.15364	-0.03469
WILDALL	0.32209	0.02523	-0.08530	-0.12391	0.02704	-0.04092
NRIFOR	0.00024	0.03222	0.54449	-0.09404	-0.17801	0.05815

Table 4–Factor analysis for water resources

Rotated Factor Pattern

	FACTOR1	FACTOR2	FACTOR3	FACTOR4
ABIMARIN	0.74656	-0.05863	0.05108	0.18041
ABICANO2	0.07246	0.20150	0.52140	-0.41963
ABIDIVE2	0.69021	0.04161	-0.00785	-0.20920
ABIFISH2	0.86595	0.04663	0.10110	0.06997
ABIGUIDE	0.51047	0.46629	0.00283	-0.16555
AWAMILES	-0.03068	0.80615	0.15799	0.11970
WSRALL	-0.00754	0.72185	-0.10717	0.04406
FLATWATR	0.02287	0.00993	0.81184	-0.01377
RUNWATER	0.02606	0.22533	0.06960	0.72816
BAYEST	0.51182	-0.07771	0.04892	0.40394
NRIWETL	0.09796	0.08031	0.72509	0.43026
RIVMILES	0.03474	0.74067	0.16327	0.04424

	1	2	3	4
Eigenvalue	2.6977	1.9415	1.3617	1.0933
Proportion	0.2248	0.1618	0.1135	0.0911
Cumulative	0.2248	0.3866	0.5001	0.5912

Standardized Scoring Coefficients

	FACTOR1	FACTOR2	FACTOR3	FACTOR4
ABIMARIN	0.32189	-0.07185	-0.02194	0.11061
ABICANO2	0.01674	0.06249	0.37407	-0.42650
ABIDIVE2	0.32031	0.00443	-0.03574	-0.22632
ABIFISH2	0.37475	-0.02304	0.00372	-0.00222
ABIGUIDE	0.22027	0.22691	-0.06613	-0.19576
AWAMILES	-0.06213	0.39411	0.01510	0.05926
WSRALL	-0.02693	0.38140	-0.15542	0.01849
FLATWATR	-0.04139	-0.08219	0.56432	-0.08552
RUNWATER	-0.04576	0.07720	-0.04159	0.62093
BAYEST	0.20419	-0.08171	-0.02607	0.32173
NRIWETL	-0.03196	-0.05804	0.45234	0.30372
RIVMILES	-0.02610	0.36047	0.02826	-0.00858

Table 5–Factor analysis for Winter resources

Rotated Factor Pattern

	FACTOR1	FACTOR2
SNOWLAND	0.06488	0.87484
SNOWAG	0.03094	0.70461
CCSFIRM2	0.75089	0.11071
DSKIACRE	0.54590	0.11394
SNOWTRAL	0.75433	-0.02830
SNOWMTN	0.32477	0.80521
SNOWFOR	0.68840	0.21025
Eigenvalue	2.6069	1.3889
Proportion	0.3724	0.1984
Cumulative	0.3724	0.5708

Standardized Scoring Coefficients

	FACTOR1	FACTOR2
SNOWLAND	-0.11161	0.47605
SNOWAG	-0.10155	0.38700
CCSFIRM2	0.39210	-0.06463
DSKIACRE	0.27943	-0.02836
SNOWTRAL	0.41736	-0.14259
SNOWMTN	0.04225	0.39360
SNOWFOR	0.34118	0.00128

Table 6–Interpretation of retained factors.

FACTOR	INTERPRETATION
URB1	Developed, local use facilities, closely tied to population growth. Associated with local park and recreation departments.
URB2	Fairgrounds, greenways, rail-trails.
LAND1	Great outdoors resources. Mountains, wilderness, Forest Service and National Park Service lands, and outfitter and guide services.
LAND2	Lands set aside for habitat and wildlife: primarily owned by Fish and Wildlife Service and The Nature Conservancy.
LAND3	State parks and privately owned forest lands.
LAND4	Western agricultural lands, mostly Bureau of Land Management and private agricultural acres.
LAND5	Camping areas (public and private), and hunting/fishing opportunities.
LAND6	Other Federal recreation lands (mostly TVA, COE, BuRec), and public camping opportunities.
WATER1	Coastal and large water body resources: marinas, fishing, other boating opportunities.
WATER2	Wild, scenic, and whitewater river opportunities.
WATER3	Flatwater and wetlands areas.
WATER4	Lowland river resources, especially rivers near wetlands or coasts.
SNOW1	Developed winter (i.e., ski) opportunities, and forest lands.
SNOW2	Undeveloped agricultural and public recreation lands in mountains.

Table 7–Diagnostics for supply measures.

FACTOR	Mean	Std Dev	Min.	Max.	% >0
URB1	-3.299	6.121	-38.7	6.0	28.1
URB2	-2.898	8.369	-57.9	42.3	35.8
LAND1	-0.538	15.731	-43.3	151.0	13.8
LAND2	-1.937	5.767	-45.3	53.7	48.2
LAND3	-5.332	16.623	-118.5	96.0	42.3
LAND4	3.523	19.906	-19.9	163.9	29.6
LAND5	-2.395	6.519	-48.4	19.6	35.1
LAND6	0.490	7.704	-19.4	110.3	40.2
WATR1	-2.928	6.370	-47.5	18.0	28.2
WATR2	-1.306	12.200	-41.8	104.0	24.4
WATR3	-1.018	10.434	-37.7	98.2	31.1
WATR4	-0.768	7.480	-32.6	89.1	34.9
SNOW1	-3.219	10.996	-64.0	103.2	27.3
SNOW2	1.987	21.654	-22.4	149.7	18.0